Office of the Secretary of Defense

Defense Microelectronics Activity (DMEA)

Program Manager's Handbook

- *Common Practices to Mitigate the Risk of*

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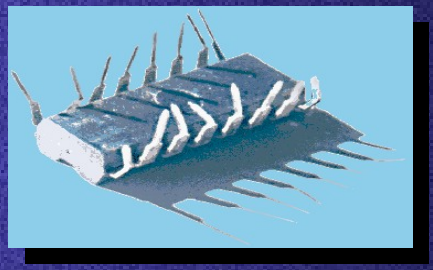
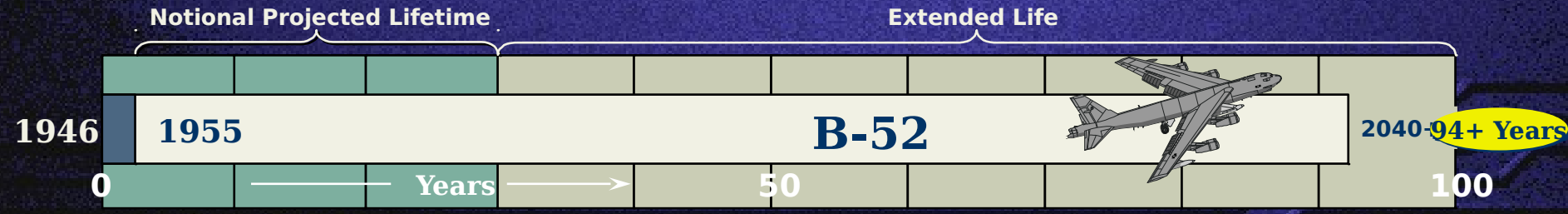
Outline

- DMEA Overview
- Program Managers Handbook – *Common Practices to Mitigate the Risk of Obsolescence*
- Resolution Cost Factors for Diminishing Manufacturing Sources and Material Shortages
- DMSMS ACQUISITION GUIDELINES - *Implementing Parts Obsolescence Management Contractual Requirements*

The Challenge

- Increased use / reliance on microelectronics (“Smart” weapon systems)
  - Strategic, tactical, C4I
  - Critical DoD Technology
- Decreased stability
  - Dynamic development drives obsolescence cycles of 18 months or less
  - Over 95% of all US DoD DMS cases are microelectronics
- Increased weapon life cycles
  - “older” technology
  - Many 5 volt
  - Little / no data



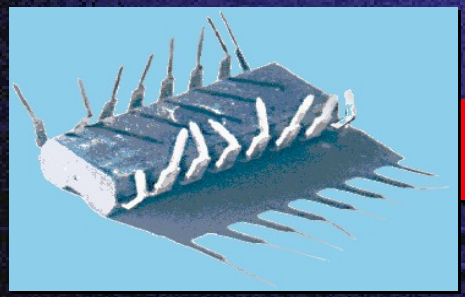


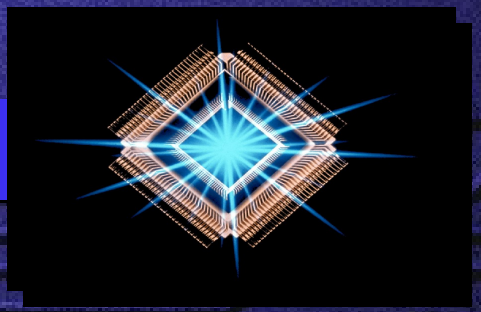
The Challenge

- Commercial market (COTS) drives the technology
  - Quick turns (dynamic technology & market - hard to predict)
  - Very high volumes
  - Lower voltage devices
  - Capacity restrained
  - Motivation is profit, competitive advantage, and market share
- Government Defense Agencies / Defense Industry have the same problem
  - Total combined market share now < 0.1%
  - Defense Needs: Critical Technology required in low volume for long terms
  - Market Reality: Availability only for very short periods to high volume customers
- Result: No products / No leverage

DMEA Mission

- DoD Mission - Provide microelectronics technology *solutions*
  - DoD / government
  - Industry / foreign allies
  - Leverage new advanced microelectronics technologies to improve capability, performance and reliability
  - Reduce effects of rapid obsolescence (quick / flexible)
    - Coordinate DOD activities
    - Develop OSD policy and strategy
- Established by Secretary of Defense
  - Defined DMEA mission & specific organizational structure
  - Deliberately assigned to report directly to the Deputy Under Secretary of Defense for Logistics & Materiel Readiness



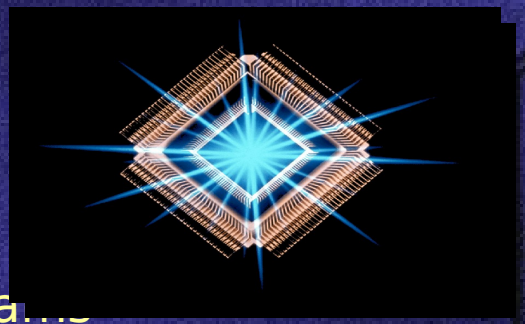


DMEA Solution Strategy "Proactive"

- Solutions must include the reality of Commercial Market
  - Obsolescence is a business decision
- Technical solutions must have a valid business model
  - Technically correct
  - Commercially viable
  - Quickly flexes with unpredictable market
  - Ensure long term requirement

Total Solution Approach

- Technical
  - Verify problems
    - Analyze
    - Reverse engineer, if necessary
    - Consolidate requirements with other progra…
  - Develop solution options
    - Component / Board / Box / System
  - Leverage industry partnerships
- Management
  - Provide guidance
- Provide “smart” acquisition & suppor…
- Provide *solutions* at best possible val…



A Call to “ARMS!”

DMEA’s Advanced Reconfigurable Manufacturing for Semiconductors

- Government / Semiconductor Industry partnership
  - New Flex Foundry technology
  - New business model
- Government-held process licenses
  - *No commercial conflicts*
  - Prototype / low volume production by DMEA
  - High volume production by industry
- Terminal transfer to DMEA upon OEM business decisio
  - Transfers *industry*-developed *& funded* (commercial) technol
    - No government subsidies required
  - COTS as a solution, not a problem (save processes, not parts)!
  - Ensures continued DoD supply (incl 5v) as industry flexes with market
- Truly flexible
  - Multiple companies / licenses - multiple processes / products
  - Not just one company / one process
- The first real solution to obsolescence, not just a mitigation strategy…while using a modern business model :

Just enough / Just in time / On Demand!

DoD Coordinated Solutions

Program Offices

- ***Unique expertise***
- **Leveraged across DoD**
  - **Supports all Services**
  - **Efficient Org Structure**

  (Only 136 total PEs)
- **Leveraged solutions**
  - **Technically correct**
  - **Economically viable**
- **Consolidated requirements**

Partners

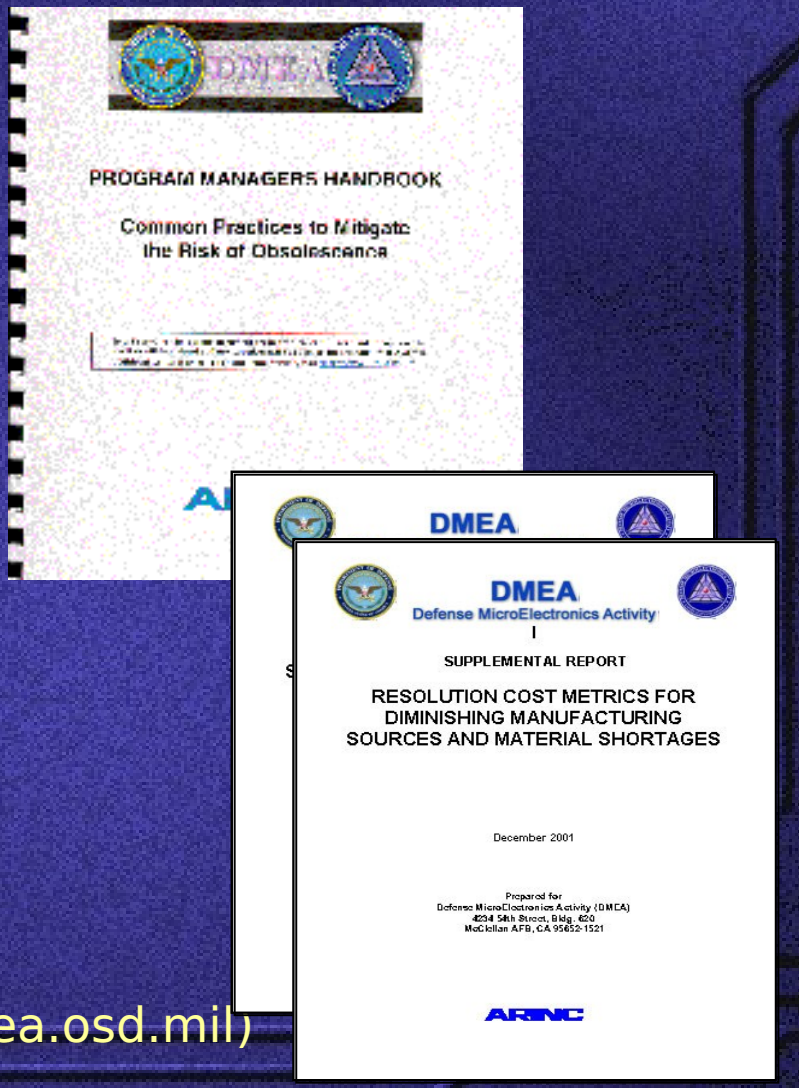
Semiconductor

Defense

After-Market

DMEA Program Guidance Documents

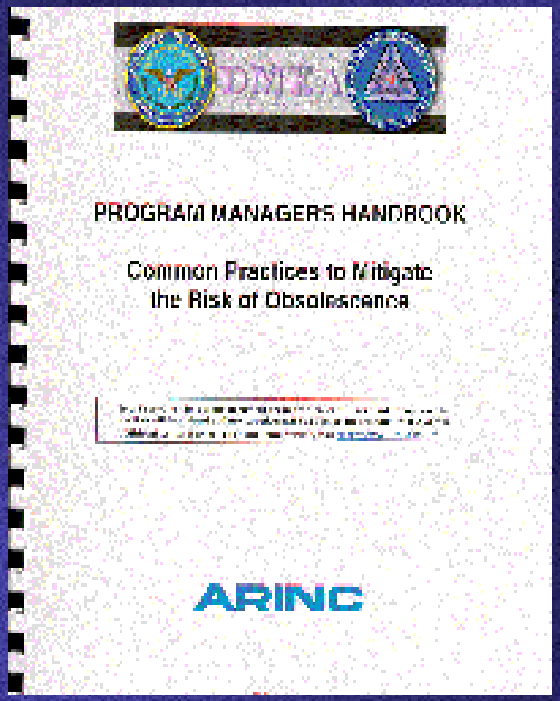
- Program Managers Handbook – *Common Practices to Mitigate the Risk of Obsolescence*
- Resolution Cost Metrics for DMSMS
- DMSMS ACQUISITION GUIDELINES - *Implementing Parts Obsolescence Management Contractual Requirements*



(Documents available at: www.dmea.osd.mil)

Program Managers Handbook

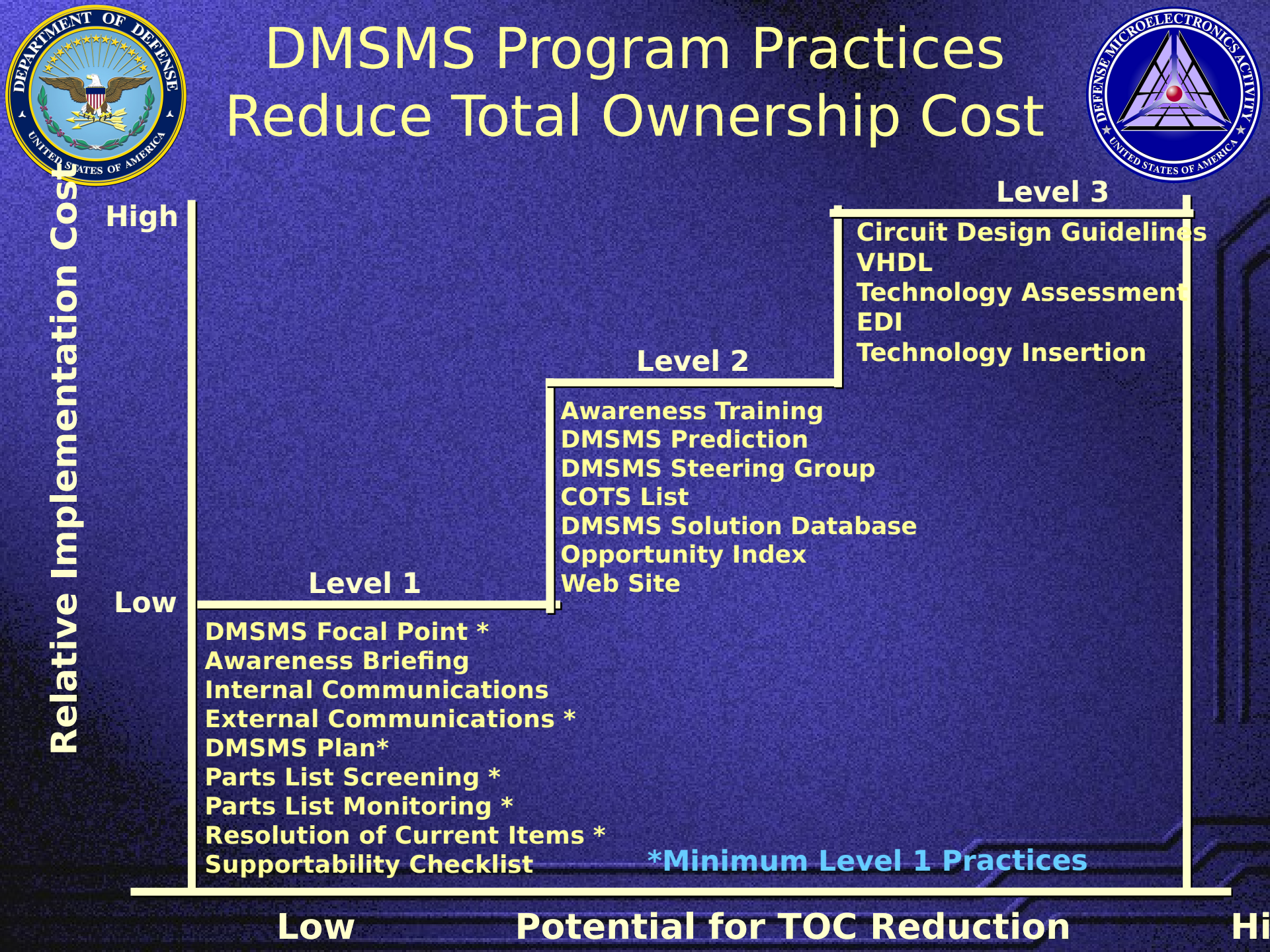
- Program Managers Handbook – Common Practices to Mitigate the Risk of Obsolescence (ARINC May 2000)
- Resource for program managers
- Complements other resolution guides:
  - Naval Sea Systems Command –*Case Resolution Procedures Guide*
  - Air Force Materiel Command – *DMSMS Program Case Resolution Guide*
  - Army Materiel Command – *DMSMS Case Resolution Guide*



Program Managers Handbook

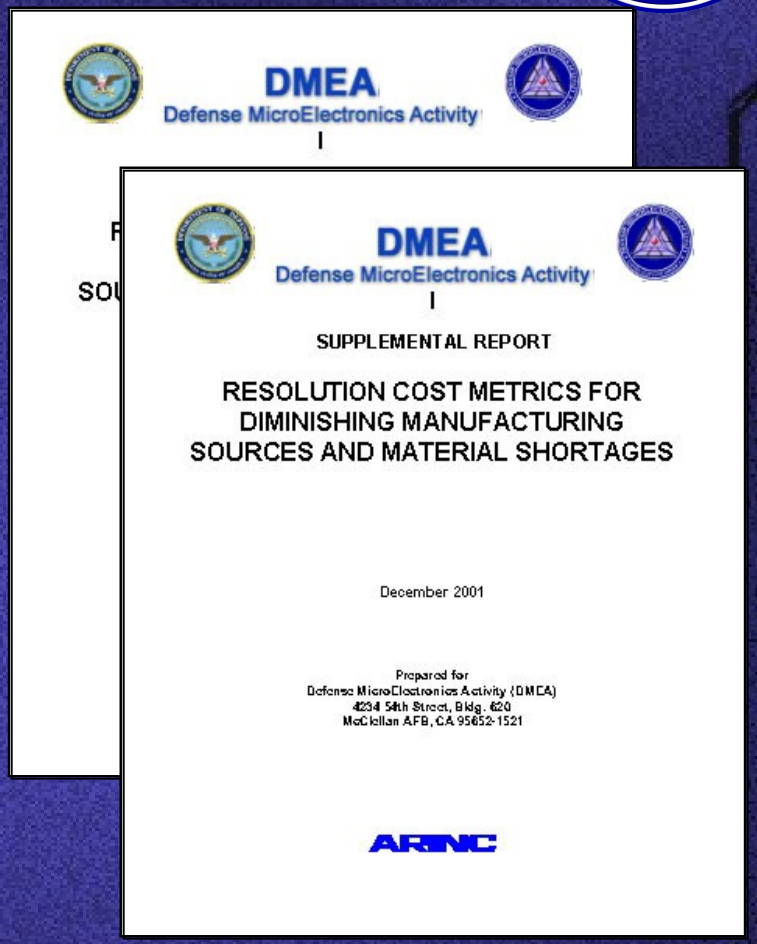
- Provides guideance to Program Managers
  - Best Practices
  - Resources
- Triggers
- Identifies Implementation Intensity
- Supportability Checklist
- Cost Estimating

DMSMS Program Practices Reduce Total Ownership Cost



Resolution Cost Metrics

- Background
- Data Collection
- Cost Avoidance Methodology
- Benefits



(Available at: www.dmea.osd.m

Cost Metrics Background

- US Government Accounting Office Report (April 1995)
  - Little or no cost data existed on DMSMS impacts, resolutions, or the cost-effectiveness of implementing a DMSMS program
  - The response: Organizations began to collect and report data
- DoD DMSMS Working Group had concerns about available cost data:
  - Developed by different organizations
  - Inconsistent reporting methods
  - Lack of historical cost data on common resolutions
  - No agreed-upon definition for cost avoidance metric established
  - No average cost avoidance values available for common resolutions (For use when no program specific data are available)
  - Lack of special testing cost data
- Goal ➔ Create a consistent set of cost metrics (factors and methodology) to measure progress

Cost Metrics
Data Sources Contacted

- Air Portugal
- Austin Semiconductor
- Boeing
- Brookhaven National Laboratory
- Burlington Microelectronics
- Defense Microelectronics Activity (DMEA)
- Defense Supply Center Columbus (DSCC)
- Electronic Industry Association
- Harris Semiconductor
- Haystack on CD-ROM
- Honeywell
- Insight Analytical Labs, Inc.
- ISE Labs Inc.
- Joint Surveillance Target Attack Radar System (JSTARS) Program Office
- Joint Tactical Information Distribution System (JTIDS) Program Office
- Lansdale Semiconductor, Inc.
- Litton
- Lockheed Martin Vought Systems
- MITRE Corporation
- MTS Microelectronics Inc.
- Naval Air Systems Command
- Naval Supply Systems Command
- Northrop Grumman
- Ogden Air Logistics Center
- PMA-209
- Rochester Electronics
- Rockwell Collins
- Sarnoff Corporation
- Sextant Avionique
- Texas Instruments
- Warner Robins ALC

Note: Some sources declined to provide data because of competition; others do not track cost of

Cost Avoidance Values

(Then Year 2002)

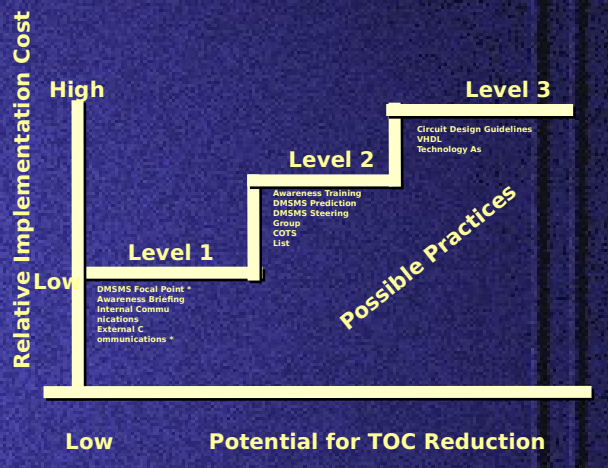
Resolution Type		Cost Avoidance Calculation (Average)	
		NRE	Cost Avoidance
Existing Stock			$ 7,000
Alternate		$ 7,000	12,000
Substitute		19,000	31,000
Aftermarket		50,000	22,000
Emulation		72,000	45,000
Redesign	Minor	117,000	316,000
	Major	433,000	0
LOT or Bridge Buy*		N/A	N/A
Reclamation**		2,000	N/A

*LOT or Bridge Buy cost is program specific

**Reclamation is not recommended for microelectronics

Cost Avoidance Leads to Reduced TOC

- DMSMS Program practices ensure the most cost effective resolution is selected by:
  - Providing a resolution for every DMSMS case
  - Selecting resolutions based on program constraints
    - Available funding
    - Planned technology refresh (Technology Update Program)
  - Selecting resolutions that do not degrade reliability
  - Advising that not all resolutions are available to each program



Acquisition Guidelines

- **DMSMS ACQUISITION GUIDELINES - *Implementing Parts Obsolescence Management Contractual Requirements***
  - ***Published by DMEA and ARINC (2001)***
- **Provides contract guidance for obsolescence management**
- **Many examples of contract language**

Summary

- **DMEA Provides Program-wide or case specific DMSMS Solutions**
  - Chip-level Solutions
    - Commercial and/or DMEA Fabrication
  - Board/Box/System level Solutions
- **DMEA has developed documents that provide a foundation for Proactive DMSMS Management**
  - Program Managers Handbook – *Common Practices to Mitigate the Risk of Obsolescence*
  - Resolution Cost Factors for Diminishing Manufacturing Sources and Material Shortages
  - DMSMS ACQUISITION GUIDELINES - *Implementing Parts Obsolescence Management Contractual Requirements*

DMEA's mission is to provide microelectronics technology solutions